Unilateral blindness from aspergilloma at the right optic foramen

Case report

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The clinical course of mycotic infections of the central nervous system is usually like that of meningitis; only in exceptional cases do these infections localize as space-occupying lesions, such as abscesses or granulomas, requiring neurosurgical attention. In such cases surgery is based on the more or less general diagnosis of intracranial mass, and the specific diagnosis is made postoperatively. These cases are very rare; in the literature there are only seven cases operated on.\(^1\),\(^2\),\(^5\)-\(^7\),\(^10\) This report describes the case of a patient for whom the preoperative diagnosis was meningioma of the right optic foramen whereas in fact he had an aspergilloma.

Case Report

A 61-year-old man was admitted to the Instituto Neurologico of Milan in July, 1967, because of a right parietotemporal headache of 4 months' duration. At first it had been intermittent but later had become almost continuous. It was nonpulsating and not accompanied by vomiting or nausea, but over the 2 months previous to admission the visual acuity of the right eye had decreased to the point of virtual blindness.

First Examination. On admission on July 20, 1967, the general physical examination was normal. Neurological examination showed the right pupil to be distinctly larger than the left with a very weak reaction to direct light; the consensual reaction was unaffected, and the extrinsic eye movements were normal. Visual acuity on the right was almost nil, although the patient could just distinguish light from dark in the right superior hemiquadrant; examination of the fundus disclosed a slightly discolored disc with clear-cut edges and normal vessels. Fundus, visual acuity, and visual field were normal on the left, and the rest of the neurological examination was normal. The blood and urine tests and examination of the cerebrospinal fluid were normal; x-ray examination of the chest was normal. Plain x-ray films and tomography of the skull on July 24 showed that the right optic foramen was distinctly enlarged and its rim thickened; there was an imprint on the corresponding superior wall of the right sphenoid sinus like that of a foraminal meningioma. The left optic foramen was normal (Fig. 1). During right carotid angiography on July 26 the right ophthalmic artery did not fill, and at the site of its usual origin there was a small anterior imprint on the carotid siphon (Fig. 2), confirming the diagnostic impression of meningioma of the right optic foramen.

Operation. On August 10 a right frontal craniotomy was performed; after removal of the bone flap, the dura was opened and the frontal lobe raised until the optic nerves and chiasma were uncovered. The right optic nerve was elevated, enlarged, and pale, and
when displaced medially a grayish pink, granular, pea-sized node was found penetrating the optic foramen between the nerve and the right carotid artery. The ligament of the optic canal was incised and the bony surface of the foramen removed; part of the tumor could then be removed but complete removal was not possible without injuring the optic nerve to which the tumor was adherent. Since there was no vision in this eye it
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was thought best to cut the right optic nerve close to the chiasma and inside the orbit and to remove the remainder of the abnormal tissue. The dura was sutured, the bone flap replaced and fixed, and the soft tissues sutured in layers.

Microscopic specimens ruled out meningioma and revealed masses of septate, ramified hyphae (Fig. 3) about 3 to 4 μ in diameter, with frequent swellings that sometimes had a cystic appearance. The hyphae were surrounded by patches of necrosis, numerous neutrophil granulocytes, and other evidence of inflammation (Fig. 3 right). The histological diagnosis was Aspergillus granuloma; unfortunately the strain could not be specified because, as mycosis had not been suspected, no cultures of the operative material were made during the operation.

Postoperative Course. Recovery was uneventful and on discharge on August 20 there was only enophthalmos, shrinkage of the palpebral tissue, and amaurosis of the right eye. At that time the result of the histological examination was not final, and no specific therapy was prescribed; the patient was simply asked to return for a checkup a little later on.

At examination 3 weeks later the patient

![Fig. 2. Right carotid angiography: the ophthalmic artery has not filled and there is a slight imprint at its usual site of origin (arrow).](image)

![Fig. 3. Left: Photomicrograph showing cluster of Aspergillus hyphae, septate and ramified, with bulbous swellings. H & E, ×600. Right: Photomicrograph showing inflammatory reaction of the tissues adjacent to the Aspergillus colonies. H & E, ×120.](image)
was in good shape generally but the operative flap was inflamed along the upper edge. By then the histological examination had been completed, and the flap was presumed to be infected with mycosis. The patient was therefore readmitted.

Second Examination. On readmission on September 23, 1967, it was found that separation had occurred for about 1 cm along the upper margin of the flap with discharge of a few drops of pus-like fluid. Antibiotic therapy with Mysteclin (tetracycline and amphotericin B, Squibb) was started at once, and repeated cultures were made of the cerebrospinal fluid and of the matter removed from the diastasis; these were, however, all negative for Aspergillus strains. The operative incision healed well, and the patient was discharged in excellent health on September 28 with instructions to continue Mysteclin therapy for 1 month. He has been followed periodically since then and was still well in February, 1969.

Discussion

Aspergillus infections of the central nervous system are relatively rare. In all cases checked at necropsy the cerebral infection originated with Aspergillus infection of other organs, usually the lungs, but sometimes the orbit, or the paranasal sinuses. Mycosis of the brain usually seems to be disseminated through the blood, although the infection may be carried via the nasal cavities, the paranasal sinuses, or the orbit. On rare occasions the fungus has reached the central nervous system following spinal puncture or the injection of therapeutic materials into the vertebral canal or intracranial cavities.

Five of the seven surgical cases reported came to necropsy; in the one described by Cawley the Aspergillus infection was generalized, in that of Just the portal of entry was probably the nasal cavities, whereas in the two cases of Jackson, et al., and the one of Ziskind, et al, the brain was apparently the primary site.

Cerebral Aspergillus infections may assume several anatomic patterns: characteristically, in acute or subacute cases patches of hemorrhagic necrosis are present, whereas in long-standing lesions the inflammation is of the granulomatous type. The bleeding, nearly always present in Aspergillus infections, is due to the peculiar affinity of the mycete for the blood vessels. The site, with single or multiple foci, may be the cortex or the white substance. Mycotic meningitis is often associated with the focal manifestations.

Often cerebral Aspergillus infections can only be diagnosed histologically. The mycotic nature of the lesions is rarely suspected at operation, and so no mycologic cultures of the infected material are made. Histologically, with the aid of suitable staining methods (hematoxlin and eosin, Gram, Gridley), the Aspergillus may be recognized by the hyphae of fairly uniform diameter with bulbous terminal swellings, the presence of frequent transverse septa, the dichotomous branching, and the slight but uniform gram-positive staining right along the hypha.

In two of the cases reported the patients died shortly after operation, in three there was temporary improvement but the patients died within 9 months, 10 months, and 18 months, whereas in David's case there was surgical cure but no mention of the duration of postoperative survival. The only permanent cures reported thus seem to be the case of a child still in excellent health 4 years after the removal of a cerebral abscess, by Hendrick and Conen, and our patient, who is well 15 months after operation.

We think that in our case success was due to three factors: 1) absence of other clinically active sites, 2) radical surgical removal, 3) prolonged antibiotic therapy with amphotericin B.

Summary

A condition diagnosed clinically as meningioma of the right optic foramen proved at operation to be a granuloma and at histological examination an Aspergillus granuloma. This was removed radically and the patient, a 61-year-old man, is in good health 15 months after operation. The pathogenesis of the lesion has been discussed in the light of the data in the literature.

References

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